Form C-104
Rev. 2/01

CONSTRUCTION VALUE ENGINEERING CONCEPT PROPOSAL
MISSOURI DEPARTMENT OF TRANSPORTATION

Date 06/05/2009

Contract ID 070928-X01 **Job No.** J0P0928

County Madison **Route** 67 **Original Bid Cost** $37,597,624.33

Contractor Emery Sapp & Sons **By** Matthew Oesch

Designed By Matthew Oesch **Phone** (573) 489-9216

VECP 09-49

1. **Description of existing requirements and proposed change(s). Advantages/Disadvantages**

   Route C is designed for realigned from the new four lane east to existing Route 67. The current design would require the existing roadway be closed and demolished in order to construct the new alignment. Emery Sapp & Sons proposes to wedge the new alignment into the existing roadway with asphalt paving. Advantages to the proposal include preventing road closure of Route C, reducing the time frame of traffic disruption, expedite project, and increase cost savings. No disadvantages are foreseen with this proposal.

2. **Estimate of reduction in construction costs.** $6,345.16

3. **Prediction of any effects the proposed change(s) will have on other department costs, such as maintenance and operations.**

   None

4. **Anticipated date for submittal of detailed change(s) of items required by Section 104.6 of the Specifications.**

   06/05/2009
   (date)

5. **Deadline for issuing a change order to obtain maximum cost reduction, noting the effect of contract completion time or delivery schedule.**

   06/22/2009 (date) — Provide ample time to grade and prep for Stage 1 prior to paving. (effect)

6. **Dates of any previous or concurrent submission of the same proposal.**

   N/A
   (date and/or dates)

Additional Comments:

A letter with detailed explanations of the construction modifications and spreadsheets detailing cost savings will be included.

***** Portion Below This Line To Be Filled Out by MoDOT *****

Comments:

Rte. C VE
ESS VE #3
ESS to be figured a price on cold milling a butt joint.

Submitted By Resident Engineer — Date: 6-30-09

Comments: 50/50 split

☑ **Approval Recommended**
☐ **Rejection Recommended**

Mark Shelton by [illegible] — District Engineer — Date: 7-1-09

Comments:

☑ **Approval**
☐ **Rejection**

David D. Gaddis — State Operations Engineer BAW — Date: 7-6-09

Distribution: Resident Engineer, District Operations Engineer, State Operations Engineer
*Value Engineering Administrator - *MoDOT, P.O. Box 270, Jefferson City, MO 65102

Mr. Matt Malone, R.E.
Missouri Dept. of Transportation
105 Industrial Dr.
Park Hills, MO 63601

RE: Value Engineering Proposal 3
Rte. 67, Madison County,
Job No. J0P0928

This letter is written in proposition of a Value Engineering proposal to the construction requirements of Route C from 0+81.6 to 3+81.6. Emery Sapp & Sons proposes to wedge the newly aligned Route C from 1+50 to 3+75 into existing Route C using asphalt pavement.

Under the original design requirements existing Route C would need to be demolished from 0+81.6 to 3+75 in order for the new alignment to be constructed. This would require Rte C to be closed for up to two weeks, causing traffic to use a lengthy detour to the south by way of Rte N in order to obtain access to US 67. The new alignment for Rte C crosses over the existing road way and would require the old roadway to be cut out 1 – 2 ft in order for the new top of pavement grades to be obtained. Full depth pavement of 5 ¼" Bit Base and 1 ¾" BP-1would be installed for the entire length 0+81.6 to 3+75.

Emery Sapp & Sons proposes the new alignment be raised in from 3+81.6 – 1+50 in such a way that the new Rte C will meet up with the existing edge of pavement, preventing the old roadway from requiring removal. This will allow Rte C to remain open of the entire length of construction on the tie-in. Flaggers will be used to monitor traffic and maintain safety as the tie-in is being constructed. Edge treatment will be placed along the existing edge of pavement to maintain motorist safety while construction is temporarily inactive. Addition asphalt for shoulder support one foot wide by six inches deep of Bit Base (in addition to the full depth pavement leading up to it) will be placed along the edge of the existing pavement from 3+75 to 1+50 to provided added stability to the joint between new and existing pavement. Full depth 5 ¼" Bit Base would be laid at design width from 3+81.6 up to the edge of the existing pavement at 3+75, where it would taper from 22' – 0' along the edge of existing Rte C from 3+75 to 1+50. The full depth Bit Base would be placed in such a manner that the meets flush with the existing pavement. Then 1 ¾" of BP-1 will be laid over the new bite base and existing pavement from 3+81.6 – 1+50 forming a smooth tie-in. From 1+50- 0+81.6 the BP-1 would be tapered down from 1 ¾" to match existing pavement. A butt joint may be added at 0+81.6 for additional cost if MoDOT believes it to be necessary.

By using the proposed wedging design over the original design several advantages are obtained. The wedging scenario will allow the new roadway to be constructed under live traffic. This will prevent road closure of Rte C, which would cause lengthy detours to a heavily traveled letter route. By wedging with asphalt less grading is required resulting in faster completion of the roadway. This will shorten the time frame in which motorist will be disrupted, thus increasing highway safety. Cost savings of $6,345.16 are obtained by using the wedging scenario because less asphalt and Type 1 base are required to cover the same area. No disadvantages appear evident when using the wedging vs. completely realigning the roadway as required by the original design.

In conclusion the value engineering proposal will increase safety for traveling motorist by shortening the time frame required to construct the tie-in. The need for road closures will be completely eliminated, preventing extensive delays and detours for the numerous public and freight traveling Rte C on the daily basis. A cost savings of only $6,345.16 will be obtained by using the value engineering proposal. Emery Sapp & Sons believes this proposal to be the safest and most cost effective scenario for completing the Rte C tie-in to existing US 67 while still allowing the traffic passage through the work zone.

Area of full depth saved by wedging over old asphalt from 1+50-3+75 = 2723.2 sqft 302.6 sqyd

Bit Base 44.13 CY => 89.7 Tons Saved

BP-1 14.71 CY => 30.0 Tons Needed

Shoulder Treatment for Wedge = 225.8 ft x 1 ft wide x 6" deep = 4.2 CY => 8.5 Tons Bit Base

Bit Base = 8.5 Tons Needed

Area of full depth pavement needed from 1+50-3+75 = 2236.2 sqft 248.5 sqyd

Bit Base 36.23 CY => 73.7 Tons Needed

BP-1 12.08 CY => 24.6 Tons Needed

Pavement needed from 1+50 to 0+81.6

BP-1= 8.5 Tons ---> 68.4' long x 22' wide x .15'->0' deep = 112.86 sft/27 = 4.18 CY = 8.5 Tons

Pavement needed from 3+75-3+81.6

Bit Base 4.8

BP-1 1.6

Area of Type 1 Base needed by wedging over old asphalt = 248.5 SY

Type 1 Base = 248.5 SY

Extra Asphalt for making Tie-in and Wedging under Live Traffic

BP-1= 10 Tons

Bit Base = 5 Tons

Edge Treatment - cost covers put up/take down subgrade and base (2 times) **$5.00/FT** at 226 LF = **$1,130.00**

Traffic Control -Flagging under live traffic

2 hr transporting and installing signs

2 hr on preping subgrade at edge of pavement

4 hr on laying base and cutting base on edge of pavement

15 hr on laying asphalt and striping under live traffic

20 hr on shouldering up and finish grading against edge of pavement under live traffic for length of newly designed Rte C

43 HR x 2 flaggers

86 HR

2 Flaggers at 45.77/hr w/burden = **$3,753.14**

Total Bit Base Needed for VE =	**92.0 Tons**
Total BP-1 Needed for VE =	**74.7 Tons**
Type 1 Base Needed for VE =	**248.5 SY**
Edge Treament for VE =	**226 LF**
Traffic Control- Flagging	**86 HR**

Cost Difference for Wedging Route C over Existing vs. Original Design

Orginal Design

Station	Type	Length (ft)	Width (ft)	Depth	Quantity	Unit	Unit Price	Cost
0+81.6 -	Type 1 Base	299.88	22	N/A	733.04	SY	$5.25	$3,848.46
3+81.6	Optional Pavement	299.88	22		733.04	SY	$26.00	$19,059.04
							Total Cost =	**$22,907.50**

VE Proposal

Station	Type	Quantity	Unit	Unit Price	Cost
0+81.6 -	Type 1 Base	248.50	SY	$5.25	$1,304.63
3+81.6	Bit Base	92	TN	$58.00	$5,336.00
	BP-1	74.7	TN	$65.00	$4,855.50
	Edge Treatment	226	LF	$5.00	$1,130.00
	Traffic Control -Flagging	86	HR	$45.77	$3,936.22
				Total Cost =	**$16,562.35**

Total Saving Item vs. Contract = $6,345.16

VALUE ENGINEERING CHECK SHEET

TYPE OF WORK

(Check one that applies)

- ☐ Bridge/Structure/Footings
- ☐ Drainage Structures (RCP, RCB, CMP's, ect.)
- ☐ TCP/MOT
- X Paving (PCCP, ect.)
- ☐ Grading/MSE Walls
- ☐ Signal/Lighting/ITS
- ☐ Misc. _____

SUMMARY OF PROPOSAL

(If needed, condense summary to a couple of lines)

Contractor proposes to construct Route C tie-in with bituminous base and pavement while keeping roadway open to traffic. Original design would have closed road while constructing the tie-in. This is a 50/50 split.

SCANNING OF DOCUMENT

If the proposal is large, please mark or make note, which pages need to be scanned into the database. If there are special instructions, make note of them here.

One document too large to scan